

TWO NEW COTONEASTERS (COTONEASTER: ROSACEAE)
FROM YUNNAN PROVINCE, CHINA

Jeanette Fryer

Cornhill Cottage, Honeycritch Lane
Froxfield, Petersfield, Hampshire
GU32 1BE ENGLAND

Bertil Hylmöt

Bjuv, SWEDEN

ABSTRACT

Two new cotoneasters are described from Yunnan Province, China. **Cotoneaster qungbixiensis** is distinguished from the similar *C. sternianus* by its thinner, less rugose, deciduous leaves, which are more narrowly elliptic to narrowly ovate. Both species are in the herein described series Sterniani, which differs from series Franchetioides in having semi-evergreen to deciduous foliage that is green not grayish, and paler anther color. **Cotoneaster floridus** of series Dielsiani is separable from *C. dielsianus* by its less shiny and less rugose leaves, fewer-flowered inflorescences, and obovoid fruit.

RESUMEN

Se describen dos nuevos cotoneaster de la provincia de Yunnan, China. **Cotoneaster qungbixiensis** se distingue de *C. sternianus* por sus hojas caducas más delgadas, menos rugosas, que son más estrechamente elípticas a un poco aovadas. Están en la Serie Sterniani descrita como nueva, difiriendo de la Serie Franchetioides en su por tener hojas de semipermanentes a caducas que no son verde grisáceas, y el color de las anteras mucho más pálido. **Cotoneaster floridus** de la Serie Dielsiani es separable de *C. dielsianus* por sus hojas menos brillantes y menos rugosas, inflorescencias con menos flores, y frutos obovoides.

In preparation of a monograph of the genus *Cotoneaster* two new species and one new series have come to light, all in the subgenus *Cotoneaster*, and are described here so the names are available for use in the upcoming treatment of the genus in the Flora of North America.

Cotoneaster series Sterniani J. Fryer & B. Hylmö, ser. nov. TYPE: *Cotoneaster sternianus* (Turrill) Boom, Jaarb. Ned. Dendrol. Ver. 20:81. 1957.

Affinis *Cotoneaster* series Franchetioides Flinck & B. Hylmö sed foliis sempervirens, supra atrovirens, antheris albis, pyrenis 3, –4, –vel 5 differt.

Shrubs, small to medium sized, often densely branched. **Leaves** deciduous or semi-evergreen, subcoriaceous or coriaceous, lower surface tomentose, upper surface rugose. **Inflorescences** 1–20-flowered; the fertile shoots 10–70 mm long. **Flowers** with hypanthium tomentose-pilose. Anthers mostly white. **Fruit** orange-red. Pyrenes (2–)3–4(–5). Fruiting mid to late season.

Cotoneaster series Sterniani includes five species: *Cotoneaster elegans* (Rehder & E.H. Wilson) Flinck & B. Hylmö; *C. induratus* J. Fryer & B. Hylmö; *C. insculptus* Diels; *C. qungbixiensis* J. Fryer & B. Hylmö; and *C. sternianus*. Members of the series Sterniani are distributed in Asia from China (Yunnan, Xizang (Tibet), Sichuan) to Myanmar.

Species belonging to series Sterniani are closely related to those of series Franchetioides, which differ in having evergreen leaves, with the upper leaf surface grayish-green, anthers mauve, pink, or purple, and pyrenes 2 or 3 per fruit.

Cotoneaster qungbixiensis J. Fryer & B. Hylmö, sp. nov. (**Fig. 1**). TYPE: CHINA. YUNNAN: Dali Xian, near Dali, eastern slope of Cangshan, Qung Bi Xi, 15 Sep 1987, K. Brickell & A. Leslie 12455 (HOLOTYPE: WSY; ISOTYPES: E, KUN).

Affinis *Cotoneaster sternianus* (Turrill) Boom sed foliis deciduo vel semisempervirens chartaceis in surculorum sterilium angusto-ovatis vel angusto-ellipticis apice acutis vel acutis truncatis et venis 2–4 bini differt.

Shrubs, 2–3 m tall. Branches erect and arched, spreading; branchlets distichous or spiraled, reddish-brown, initially strigose-pilose. **Leaves** deciduous or semi-evergreen, chartaceous, on sterile shoots narrowly ovate or narrowly elliptic, 28–42 × 13–21 mm, base cuneate or obtuse, apex typically acute-truncate, or rarely

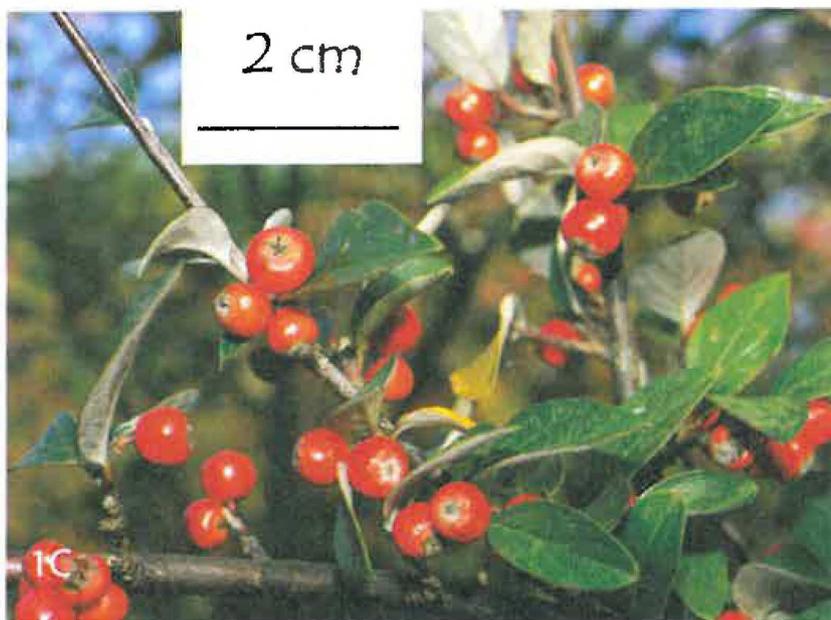
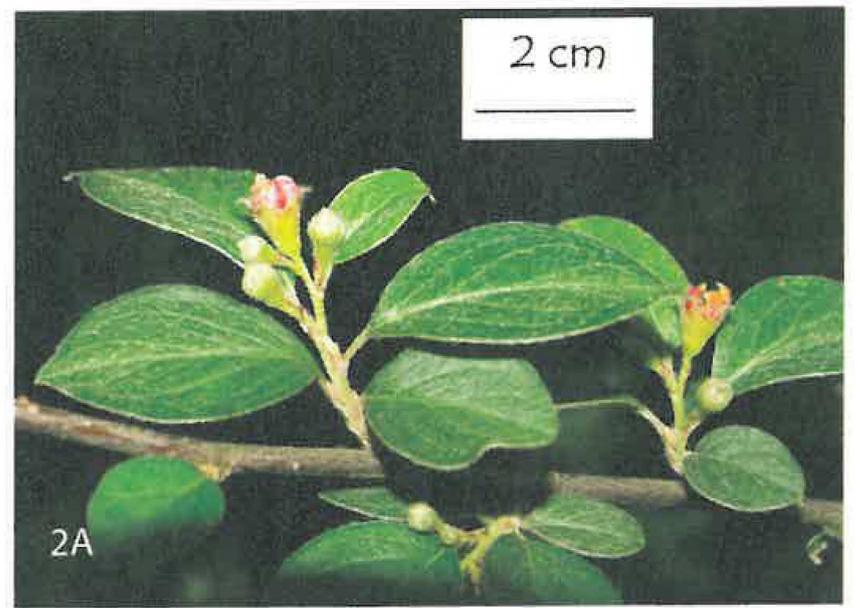


FIG. 1. *Cotoneaster qungbixiensis*. A. Flowering shoot. B, C. Fruiting shoots.

FIG. 2. *Cotoneaster floridus*. A. Flowering shoots. B, C. Fruiting shoots.

acute, lower surface greyish tomentose, upper surface slightly rugose, dark green, shiny, initially pilose, lateral veins 2–4 impressed pairs; petiole 3–4 mm long, often red, strigose-pilose. **Inflorescences** compact, 3–9(–15) flowered; fertile shoots 30–50 mm long with 4–6 leaves; pedicels 1–3 mm, strigose-pilose. **Flowers** (including hypanthium) 7–8 mm long; hypanthium infundibulate, silky tomentose; sepals cuspidate or acuminate, tomentose. Corolla open; petals erect-incurved, pink with dark red base, apex yellowish to off-white. Stamens 20; filaments dark red; anthers white. **Fruit** orange-red, slightly shiny, globose or obovoid, 8–10 mm, pilose, calyx lobes infolded, appressed and forming a flat apex, tomentose. Pyrenes 2–3–4 (ca. 10%–80%–10%), rarely 5, persistent style on abaxial surface, 2/3 from base.

Growing large batches of seeds yields uniform plants, suggesting it is an apomictic tetraploid, like many species of *Cotoneaster* in the subgenus *Cotoneaster* (Hjelmqvist 1962; Bartish et al. 2001) and within other genera of the subfamily Maloidea (Campbell & Dickinson 1990; Campbell et al. 1991). The chromosomes of cultivated material in England were recently counted by both John Bailey and Hugh McAllister, confirming *C. qungbixiensis* is a tetraploid, $2n = 68$.

Other specimens examined: CHINA. YUNNAN: Dali, E slope of Cangshan Mountain, track to Lonquan Peak, 4 Nov 1996, J. Fryer JFWY-063 (GB); Yunnan, between Zhongdian and Dali, Beahan Chiang, 22 Sep 1994, *Alpine Garden Society China Expedition 1114* (E); Yunnan, Dali, on Cangshan, above a small temple, Nov 1985, C. Wingfield 772 (seed accession). SWEDEN: Bjuv, cultivated, grown from seed from type collection, Hylmö accession 2087, 11 Jul 1995, B. Hylmö s.n. (WTU). ENGLAND. HAMPSHIRE: Clanfield, cultivated, Rumsey Gardens, seed source Wingfield 772, 29 Jun 2001, J. Fryer 758 (WTU); Hampshire, Sir Harold Hillier Gardens, cultivated, Hillier accession 1994.1175*A, seed source AGS China Expedition No. 2490, 2000, J. Joyce 293 (HILL), J. Joyce 13 (HILL). U.S.A. WASHINGTON. King Co.: Seattle, Washington Park Arboretum, cultivated, accession 189-60-A, 11 Oct 2000, P.F. Zika 15550 (WTU), same shrub, 24 Jun 2006, P.F. Zika 22816 (MO, GH, NY, WTU, WTUH); same site, accession 189-60-B, 14 Dec 2006, P.F. Zika 22901 (WTU, WTUH); same site, accession 162-57-A, 24 Jun 2006, P.F. Zika 22815 (GH, OSC, WTU, WTUH). CANADA. BRITISH COLUMBIA: Saanich, Rithets Bog, escaped from cultivation, 20 Jun 2006, P.F. Zika 22807 (CAN, DAO, GH, NY, UBC, WTU), same site, 21 Oct 2007, P.F. Zika 23657 (CAN, CAS, DAO, GH, UBC, UC, V, WTU).

Phenology and ecology.—Flowering June to July; fruiting October to November. Natural populations in Yunnan Province, China, are in full sun on rocky slopes over calcareous bedrock. In cultivation, *Cotoneaster qungbixiensis* is hardy to -18°C , and is an attractive shrub with good autumn fruit color.

Cotoneaster qungbixiensis is named for the type locality on Cangshan Mountain in Yunnan. It is closely related to *C. sternianus*, which differs in having leaves that are evergreen, thicker and coriaceous, broadly elliptic to broadly ovate with apex acute or acuminate and lateral veins in 4–6 pairs.

SERIES DIELSIANI G. Klotz, *Wiss. Z. Friedrich-Schiller-Univ. Jena, Math.-Naturwiss. Reihe* 21:991. 1972.

Cotoneaster floridus J. Fryer & B. Hylmö, sp. nov. (**Fig. 2**). TYPE: CHINA. YUNNAN: Muli, Washin area, near lamasery, 5 Oct 1937, T.T. Yü 14430 (HOLOTYPE: E; ISOTYPE: A, BM).

Affinis *Cotoneaster dielsianus* E. Pritz. sed foliis chartaceis ad subcoriaceis, supra planities obscurus, inflorescentiis 2–5-floris, fructu oblongo-obovoidus differt.

Shrubs, 1.5–2 m tall. Branches erect and arched; branchlets distichous, maroon and minutely verruculose, initially pilose-strigose. **Leaves** deciduous, chartaceous or subcoriaceous, on sterile shoots elliptic, often broadly so, 15–25 × 11–25 mm, base cuneate or obtuse, apex acuminate or acute, lower surface whitish tomentose-pilose, upper surface dark green, dull, strigose, veins 3(4) slightly impressed pairs; petiole 3–4 mm long, strigose. **Inflorescences** 2–5 flowered; fertile shoots 20–40 mm long, with mostly 4 leaves; pedicels 2–6 mm long, strigose. **Flowers** (including hypanthium) 5–6 mm long. Hypanthium turbinate, densely strigose; sepals cuspidate or acuminate, densely strigose, membranous, reddish-brown, and glabrous near margin, margin villous. Corolla closed; petals erect-incurved, pink with dark red base and white and pink border. Stamens 14–17; filaments dark red or red with pink apex; anthers white. **Fruit** rich red, intensely shiny, narrowly obovoid, 10–11 mm long, sparsely pilose, calyx lobes infolded, appressed, densely pilose. Pyrenes 2–3–4 (ca. 10%–60%–30%), persistent style on abaxial surface, 2/3 from base.

Growing large batches of seed yields uniform plants, suggesting this is another apomictic species, but the chromosomes have not been studied to confirm this.

Other specimens examined: CHINA. YUNNAN: Chungtien [Zhongdian], Pica, 30 Oct 1937, T.T. Yü 13905 (A, BM, E). ENGLAND. HAMPSHIRE: Sir Harold Hillier Gardens, cultivated, Hillier accession 1992.0451*B, 2001, J. Joyce 329 (HILL).

Cotoneaster floridus is named for its florid red fruits. It is closely related to *C. dielsianus* E. Pritz ex Diels, which differs in its thicker (coriaceous or subcoriaceous) leaves with upper surface slightly rugose and shiny, inflorescences 3–7(–10) flowered, and in its globose fruit.

Phenology and ecology.—Flowering June; fruiting September to October. Little is known about its habitat or associates where it is native in China, in Yunnan and Sichuan Provinces. In cultivation it is hardy to -21°C .

Cotoneaster floridus is frequently found in cultivation as *C. rubens* hort. non W.W. Sm., a misnomer under which it was distributed as seed from the Royal Horticultural Society Wisley Gardens in England. It can also be found under the name *C. dielsianus* var. *rubens* hort. Unfortunately, Professor Yü's collection numbers have become confused in cultivation, hence various species of *Cotoneaster* can sometimes be found under a single collection number.

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REFERENCES

- BARTISH, I.V., B. HYLMÖ, and H. NYBOM. 2001. RAPD analysis of interspecific relationships in presumably apomictic *Cotoneaster* species. *Euphytica* 120:273–280.
- CAMPBELL, C.S. and T.A. DICKINSON. 1990. Apomixis, patterns of morphological variation and species concepts in subfam. Maloideae (Rosaceae). *Syst. Bot.* 15:124–135.
- CAMPBELL, C.S., C.W. GREENE, and T.A. DICKINSON. 1991. Reproductive biology in subfam. Maloideae (Rosaceae). *Syst. Bot.* 16:333–349.
- HJELMQVIST, H. 1962. The embryo sac development of some *Cotoneaster* species. *Bot. Not.* 115:208–236.